



## THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Rajan et al.

Serial No.: 10/635,945

Filed: 8/7/2003

Title: MULTIPLE DESCRIPTION  
CODING USING TRANSFORMS  
AND DATA FUSION

Attorney Docket No.: 3040-101

Group Art Unit:

Examiner:

Assistant Commissioner for Patents  
Washington, D.C. 20231

### INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This Information Disclosure Statement is submitted:

- under 37 CFR 1.97(b), or  
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; whichever occurs last)
- under 37 CFR 1.97(c) together with either a:
  - Certification under 37 CFR 1.97(e), or
  - a \$240.00 fee under 37 CFR 1.17(p), or  
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)
- under 37 CFR 1.97(d) together with a:
  - Certification under 37 CFR 1.97(e), and
  - a petition under 37 CFR 1.97(d)(2)(ii), and
  - a \$130.00 petition fee set forth in 37 CFR 1.17(i)(1).  
(Filed after final action or notice of allowance, whichever occurs first, but before payment of the issue fee)

Applicant(s) submit herewith Form PTO 1449-Information Disclosure Citation together with copies, of publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

The relevance of the attached references is that this is the closest art of which Applicant is aware. Applicant submits that the above references taken alone or in combination neither anticipate nor render obvious the present invention. Consideration of the foregoing in relation to this application is respectfully requested.

It is requested that the information disclosed herein be made of record in this application.

Respectfully submitted,

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231.

Date of Deposit: 12/30/03

Typed Name: Jessica Costa

Signature: Jessica Costa

Jessica Costa

Jessica Costa

Attorney/Agent for Applicant(s)  
Reg. No. 41065

Date: December 29, 2003

Telephone No.: (856) 854-3999

Please type a plus sign (+) inside this box

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Substitute for form 1449A/PTO		Complete if Known	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(use as many sheets as necessary)</i>		Application Number	10/635,945
		Filing Date	8/7/2003
		First Named Inventor	Rajan et al.
		Group Art Unit	
		Examiner Name	
Sheet	1	of	2
		Attorney Docket Number	
		3040-101	

## U.S. PATENT DOCUMENTS

## FOREIGN PATENT DOCUMENTS

Examiner Signature		Date Considered	
-----------------------	--	--------------------	--

**\*EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Unique citation designation number. <sup>2</sup>See attached Kinds of U.S. Patent Documents. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup>Applicant is to place a check mark here if English language Translation is attached.

**Burden Hour Statement:** This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO:** Assistant Commissioner for Patents, Washington, DC 20231.

Please type a plus sign (+) inside this box → 

JAN 02 2004

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Substitute for form 1449B/PTO		Complete if Known	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(use as many sheets as necessary)</i>		<b>Application Number</b>	10/635,945
		<b>Filing Date</b>	8/7/2003
		<b>First Named Inventor</b>	Rajan et al.
		<b>Group Art Unit</b>	
		<b>Examiner Name</b>	
Sheet	2	of	2
		Attorney Docket Number	3040-101

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS		
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		L. H. Ozarow, "On a Source-Coding Problem with Two Channels and Three Receivers", Bell System Technical Journal, 59(10):1909-1921 (1980)
		M. W. Marcellin, T. R. Fischer, "Trellis coded Quantization of Memoryless and Gauss-Markov Sources", IEEE Transactions on Communications 38: 82-93 (1990)
		Amir Said, William A. Pearlman, "A New Fast and Efficient Image Codec Based on Set Partitioning in Hierarchical Trees", IEEE Transactions on Circuits and Systems for Video Technology, 6:1-16 (June 1996)
		J. C. Batilo and V. A. Vaishampayan, "Asymptotic Performance Of Multiple Description Transform Codes", IEEE Trans. Inform. Theory, vol. 43, no. 2, pp. 703-707 (Mar. 1997)
		S. Lopresto, K. Ramchandran and M. Orchard, "Image Coding based on Mixture Modeling of Wavelet Coefficients and a Fast Estimation-Quantization Framework", Proceedings DCC, IEEE Data Compression Conference (Mar. 1997)
		P. A. Chou, S. Mehrotra, and A. Wang, "Multiple Description Decoding Of Overcomplete Expansions Using Projections Onto Convex Sets" IEEE Data Compression Conference, Snowbird, UT, pp. 72-81, (Mar. 1999)
		Rohit Puri, Kang-Won Lee, Kannan Ramchandran and Vaduvur Bharghavan. Application of FEC based Multiple Description Coding to Internet Video Streaming and Multicast. Proceedings of the Packet Video 2000 Workshop, Forte Village Resort, Sardinia, Italy (May 2000)
		S. D. Servetto, K. Ramchandran, V. A. Vaishampayan, and K. Nahrstedt. "Multiple Description Wavelet Based Image Coding." IEEE Transactions on Image Processing, 9(5):813-826 (2000)
		J. G. Apostolopoulos, "Reliable Video Communication over Lossy Packet Networks using Multiple StateEncoding and Path Diversity", Proc. Visual Communication and Image Processing, VCIP '01, pages 392--409 (Jan 2001)
		V. K Goyal, "Multiple Description Coding: Compression Meets the Network" IEEE Signal Processing Mag., vol. 18, no. 5, pp. 74-93, Sept. 2001
		V. K Goyal and J. Kovacevic, "Generalized Multiple Description Coding with Correlating Transforms," IEEE Trans. on Information Theory, vol. 47, no. 6, pp. 2199-2224, Sept. 2001
		Goyal, Kovacvic and Kelner, "Quantization Frame Expansions with Erasures", Applied and Computational Harmonic Analysis, 10(3):202-233, May 2001
		J.G. Apostoloopoulos, S. Wee, D. Tan, G. Wornell, and T. Wong, "Multiple description Videwo Coding and Path Diversities and Streaming Media Content Delivery Networks", Hewlett-Packard Laboratories, Streaming Media Systems Group, Palo Alto, CA (May 2002)
		Xin Zhong and Bijing-Hwang Juang, "Multiple Description Speech Coding with diversities," ICASSP 2002, Orlando, Florida May 13 - 17, 2002
		J.G. Apostolopoulos, T. Wong, W. Tan, and S.J. Wee "On Multiple Description Streaming with Content Delivery Networks", IEEE INFOCOM (June 2002)
		X. Zhong, J. Arrowood, A. Moreno, M. Clements, "Multiple Description Coding For Recognizing Voice Over IP", 10th IEEE DSP Workshop, Callaway Garden, GA (2002)

Examiner Signature	Date Considered
--------------------	-----------------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Unique citation designation number. <sup>2</sup>Applicant is to place a check mark here if English language Translation is attached.